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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Industrial Application]This invention protects the electronic parts for chip molding surface mounting from contamination on the occasion of storage of a chip type electronic component, transportation, and wearing, Since it mounts in an electronic circuit board, it is made to align, and it is related with the cover tape by which a heat seal is carried out to the embossed carrier tape made from a plastic which formed the receiving pocket among the packed bodies which have a function which can be taken out.

[0002]

[Description of the Prior Art]Chip type electronic components for surface mounts, such as ICs and transistors, such as a memory and logic, a diode, and a capacitor, in recent years, It is packed and offered as a sample by the packed body which consists of a cover tape which can carry out the heat seal of the pocket which can be stored, and by which embossing shaping was carried out to the embossed carrier tape made from a plastic formed continuously, and this carrier tape according to the shape of electronic parts. After the electronic parts of contents exfoliate the cover tape of this packed body, they are taken out automatically and a surface mount is carried out to an electronic circuit board. An advancement and highly precise-ization follow the mounting technology every year, and up of productive efficiency is planned. Therefore, it is converted in the direction which rolls round a cover tape strongly so that a cover tape may not cause poor exfoliation but can take out certainly, when it has accelerated rapidly, and the mounting speed of electronic parts also exfoliates a cover tape corresponding to it at the time of mounting and takes out electronic parts in equipment. Also mounting tact It is progressing to a very early speed called 0.1 or less second / baton, and the mechanism in which a cover tape exfoliates momentarily in 0.1 or less second begins to be in use. For this reason, a cover tape is momentarily torn off by very strong power, and it came to carry out load

of the bigger impulse force than before.

[0003]Meanwhile, the troubles which raise what is called a "tape piece" that a cover tape bears the stress at the time of exfoliation, and a cover tape cuts previously have been occurring frequently recently, and have become a major factor on which the production yield is dropped. Although it had not become so big a trouble [be / no mounting speed / early] conventionally, only that of the grade which thickens thickness of the strong outer layer of mechanical strength as the measure was performed. In the case of the cover tape in a commercial scene, simple composition called two-layer [of a substratum/sealant layer] is most now, but since low-temperature sealing nature with a carrier tape turns into the characteristic of the highest priority, sealant is comparatively flexible, and resin with low heat resistance and mechanical strength is chosen. Although outstanding resin of tearing strength and shock resistance also has low density olefins, such as LLDPE and VLDPE, as sealant, a molecular weight and composition distribution are large, in the low-molecular-weight region, in the bad smell and greasiness polymers field of the film, since there was inhibition of heat-sealing nature and transparency also worsened, it boiled and depended for most tolerance over a tape piece on the mechanical strength of the outer layer. However, when the outer layer was thickened too much, the sealing nature in low temperature worsened, or there was a limit in the measure only against the outer layer thickness of a monolayer, a very powerful seal was performed and the notch entered, it was too generated by the tape piece and sufficient measures were not able to be taken.

[0004]

[Problem(s) to be Solved by the Invention]That the above problems should be solved, when this invention exfoliates a cover tape at the time of mounting, it prevents a tape piece thoroughly, and it provides the cover tape by which a heat seal is carried out to the embossed carrier tape made from a plastic which was excellent in the mechanical strength which also spoils neither low-temperature sealing nature nor transparency simultaneously.

[0005]

[Means for Solving the Problem]As an interlayer this invention to an outer layer at a biaxially oriented film and its inside Tearing resistance, Shock resistance, an ethylene-alpha olefin copolymer which polymerized with a metallocene catalyst excellent in transparency -- and. A complex film in which total light transmittance of a surface resistance value of a glue line of composition of having coated a glue line with thermoplastic adhesive of a heat-sealing lacquer type which distributed conductive impalpable powder will be not less than 70% below by 10^{13} , Or a layer which was excellent in a biaxially oriented film in an outer layer, and was excellent in shock resistance at the inside, To the inside, as an interlayer Tearing resistance, shock resistance, an ethylene-alpha olefin copolymer which polymerized with a metallocene catalyst excellent in transparency -- and. A surface resistance value of a glue line of composition of

having coated a glue line with thermoplastic adhesive of a heat-sealing lacquer type which distributed conductive impalpable powder acquires knowledge that it can become a cover tape in which a complex film in which total light transmittance will be not less than 70% has the good characteristic below by 10^{13} , It comes to complete this invention.

[0006]Namely, this invention is a receiving pocket which stores a chip type electronic component a cover tape which can carry out a heat seal to a carrier tape made from a plastic formed continuously, and this cover tape, An outer layer is a biaxially oriented film which is either polyester or polypropylene, More than 100 kg-cm/cm^2 is 100 or more kg/cm in tearing strength (JIS K 7128), and, for an interlayer, is [**** impact strength (ASTM D 1822)] 15% or less in the degree of cloudy weather (JIS K7105), It is the ethylene-alpha olefin copolymer which polymerized with a metallocene catalyst whose ratio of a molecular weight as which the melting point is 110°C or less in $0.900\text{-}0.925\text{g/cm}^3$, and density of resin is specified by a ratio of weight-average-molecular-weight (Mw) / number average molecular weight (Mn) is three or less, Polyurethane system resin in which a glue line can carry out a heat seal to a carrier tape made from a plastic, Acrylic resin, polyvinyl chloride system resin, ethylene vinyl acetate system resin, polyester system resin, butadiene series resin, or styrene resin. Or are the adhesives by these combination and either conductive impalpable powder of tin oxide and a zinc oxide is distributed in the adhesives, An addition of conductive impalpable powder is ten to 1000 weight section to base resin 100 weight section of adhesives, A surface resistance value of a glue line is below $10^{13} \Omega/\text{cm}$, Adhesive strength of a glue line of this cover tape and a sealing surface of this carrier tape is larger than adhesion strength between layers of an interlayer of this cover tape, and a glue line, and an interlayer of this cover tape, a glue line, and adhesion strength between layers are 10 per seal width of 1 mm - 130gr, a cover tape for embossed carrier tapes for surface mounts whose **** impact strength total light transmittance of this cover tape is not less than 70%, and is more than 400 kg-cm/cm^2 -- or, An outer layer is a biaxially oriented film which is either polyester or polypropylene, The 2nd layer of the inside is a layer of extension of polypropylene and nylon, or either of the unstretched films, More than 100 kg-cm/cm^2 is 100 or more kg/cm in tearing strength (JIS K 7128), and the inside is [**** impact strength (ASTM D 1822)] 15% or less in the degree of cloudy weather (JIS K 7105) as an interlayer, It is the ethylene-alpha olefin copolymer which polymerized with a metallocene catalyst whose ratio of a molecular weight as which the melting point is 110°C or less in $0.900\text{-}0.925\text{g/cm}^3$, and density of resin is specified by a ratio of weight-average-molecular-weight (Mw) / number average molecular weight (Mn) is three or less, Polyurethane system resin in which a glue line can carry out a heat seal to a carrier tape made from a plastic, Acrylic resin, polyvinyl chloride system resin, ethylene vinyl acetate system resin, polyester system resin,

butadiene series resin, or styrene resin. Are the adhesives by these combination and in the adhesives Or tin oxide, One conductive impalpable powder of the zinc oxides is distributed, and an addition of conductive impalpable powder is ten to 1000 weight section to base resin 100 weight section of adhesives, A surface resistance value of a glue line is below 10^{13} ohm/cm, Adhesive strength of a glue line of this cover tape and a sealing surface of this carrier tape is larger than adhesion strength between layers of an interlayer of this cover tape, and a glue line, and an interlayer of this cover tape, a glue line, and adhesion strength between layers are 10 per seal width of 1 mm - 130gr, Total light transmittance (JIS K 7105) of this cover tape is not less than 70%, **** impact strength is more than 400 kg-cm/cm^2 , It is a cover tape for embossed carrier tapes for surface mounts, wherein resin of an interlayer's ethylene-alpha olefin copolymer polymerizes considering dichloride zirconocene and methyl aluminoxane as a catalyst also in which construct.

[0007]

[Function]When drawing drawing 1 or drawing 2 explains the component of the cover tape 1 of this invention, in drawing 1, the outer layer 2 is either biaxially oriented film of a biaxially oriented polyester film and a biaxially oriented polypropylene film, and 6-25-micrometer-thick transparency is a film which is well excellent in heat resistance and is rigid. In less than 6 micrometers, the rigidity of an outer layer is lost, and if 25 micrometers is exceeded, it will become it is too hard and unstable [a seal]. More than 100 kg-cm/cm^2 is 100 or more kg/cm in tearing strength (JIS K 7128), and, for the interlayer 4, is [**** impact strength (ASTM D 1822)] 15% or less in the degree of cloudy weather (JIS K 7105), The ratio (polydispersed degree) of the molecular weight as which the melting point is 110°C or less in $0.900 - 0.925 \text{ g/cm}^3$, and the density of resin is specified by the ratio of weight-average-molecular-weight (Mw) / number average molecular weight (Mn) is the ethylene-alpha olefin copolymer which polymerized with the metallocene catalyst which is three or less. There is a danger of less than 100 kg/cm and **** impact strength being unable to respond to the impulse force at the time of high-speed exfoliation enough in less than 100 kg-cm/cm in tearing strength, but being generated by the tape piece. When exceeding 15%, the degree of cloudy weather will reduce the transparency of the whole cover tape greatly, and will reduce the ease of being visible of a device. If film processing becomes difficult by less than 0.900 g/cm^3 and density exceeds 0.930, as for the ethylene-alpha olefin copolymer of intermediate layer resin, low-temperature sealing nature will worsen. The good characteristic is not obtained, in order for sealing nature variation to increase polydispersed degree or more by three, and to generate the smeariness and the bad smell of a film or to drop transparency. In this case, as for resin, what depends dichloride zirconocene and methyl aluminoxane on what is called a metallocene catalyst that polymerized as a catalyst is the optimal.

[0008]The active spot is called a uniform single site catalyst, and a metallocene catalyst is distinguished from a multisite catalyst like conventional Ziegler-Natta catalyst. In the case of a multisite catalyst, since it has various kinds of active spots, and molecular weight distribution is large and comonomer contents differ for every molecule, in response to the influence of large distribution, it surely worsens at the characteristics, such as low-temperature heat-sealing nature and transparency. For example, although it is possible for giving tear resistance and ****-proof shock nature to LDPE at LLDPE, low-temperature sealing nature and transparency will worsen. On the other hand, since molecular weight distribution is narrow since the active spot of a single site catalyst is uniform, and the comonomer content of each molecule is almost equal, it can have good low-temperature heat-sealing nature and transparency. The interlayer 4 and outer layer 2 side which touches mutually can perform surface treatments, such as corona treatment, plasma treatment, and sandblast treatment, if needed, can raise adhesion power, and can be pasted together by dry laminate or an extrusion lamination. An interlayer's thickness has not less than 10 micrometers of 20-60-micrometer preferably good films. When thinner than 10 micrometers, there is no effect of tear resistance, and if thicker than 60 micrometers, heat-sealing nature will be worsened. The glue line 5 Polyurethane system resin, acrylic resin, ethylene vinyl acetate system resin, It has the characteristic which can carry out a heat seal to the carrier tape made from a plastic of a mating material with thermoplastic adhesive each simple substance heat-sealing lacquer type [one] of polyvinyl chloride system resin, a polyester system, butadiene series resin, and styrene resin resin, or its combination.

[0009]And either conductive impalpable powder of tin oxide and a zinc oxide is uniformly distributed in adhesives, in that case, below $10^{13} \text{ } \Omega/\text{cm}^2$ are required for the surface resistance value of the glue line after film production at least, and it is still more preferably good. [of the range of $10^6 \text{ } \Omega/\text{cm}^2$ - $10^{10} \text{ } \Omega/\text{cm}^2$] If it becomes larger than $10^{13} \text{ } \Omega/\text{cm}^2$, an electrostatic effect will get extremely bad and the target performance will not be obtained. The addition is ten to 1000 weight section to base resin 100 weight section of adhesives by the above-mentioned surface resistance characteristic, and its 100 to 300 weight section is still more preferably good. If less than ten weight sections, an electrostatic preventive effect will not be revealed, and if more than 1000 weight sections, the dispersibility to adhesives gets remarkably bad and it is not suitable for production. Since there is an electrostatic effect semipermanently since the electrostatic treated material itself has conductivity, influence does not do to sealing nature, either, in order not to start bleeding etc., but the surface resistance value of the glue line is adjusted to below $10^{13} \text{ } \Omega/\text{cm}^2$, Even if electronic parts contact this cover tape on the way of [conveyance] which enclosed electronic parts with this carrier tape with this cover tape, or when exfoliating this cover tape and taking up electronic parts, it does not generate but the static electricity can protect electronic parts from a static electricity

obstacle. In order to raise an electrostatic effect further, an antistatic treatment layer or a conductive layer may be provided in an outer layer side, i.e., the surface and rear surface of a biaxially oriented film. About the formation method of heat sealed type adhesives, although either the melting producing-film method or the solution producing-film method may be used, solution film production is preferably desirable from a point of the dispersibility of conductive impalpable powder.

[0010] In the seal peel process of a cover tape, the seal of this cover tape 1 is first carried out to both the sides of this carrier tape 6 continuously the shape of a rail with a width of around 1 mm at one of the two. (Drawing 3) When lengthening and removing this cover tape 1 from this carrier tape 6 next at the time of a peel, If the adhesive strength of the glue line 5 of this cover tape 1 and the sealing surface of this carrier tape 6 is smaller than the adhesion strength between layers of the interlayer 4 of this cover tape 1, and the glue line 5, Peel-off intensity corresponds with the glue line 5 of this cover tape 1, and the adhesive strength of the sealing surface of this carrier tape 6, and a peel is performed by interfacial peeling which is the peeling mechanism most general now. On the other hand, if the adhesive strength of the glue line 5 of this cover tape 1 and the sealing surface of this carrier tape 6 is larger than the adhesion strength between layers of the interlayer 4 of this cover tape 1, and the glue line 5 like this invention, the cover tape (drawing 5) after it remained in the carrier tape (drawing 4), and only the portion by which the seal was carried out among the produced glue lines 5 lengthened and was removed serves as the form where only the portion by which the glue line 5 was heat sealed fell out -- it is -- a peel is performed by **** transfer exfoliation. Namely, since peel-off intensity is the adhesion strength between layers of the glue line 5 and the interlayer 4, and a corresponding thing, the surface of separation is designed in the cover tape, it does not depend on the construction material of a carrier tape but the adhesion strength between the layer can be set up, The peel-off intensity which did not receive influence in the sealed condition of this cover tape and this carrier tape, but was stabilized is obtained. In this case, adhesives are selected so that the interlayer of this cover tape, a glue line, and the adhesion strength between layers may become ten to 70 gr still more preferably ten to 130 gr per seal width of 1 mm. When peel strength is lower than 10gr, at the time of a packed body transfer, a cover tape separates and there is a problem that the electronic parts which are contents are omitted. On the contrary, if higher than 130gr, the phenomenon which a carrier tape vibrates when exfoliating a cover tape, and jumps out of a receiving pocket just before electronic-parts wearing is carried out, i.e., a jumping trouble, will be caused. According to this transfer peeling mechanism, as compared with the conventional interfacial peeling, the dependency of seal conditions is lower, and the performance which aging of the peel-off intensity by storage environment makes few purposes can be obtained. Since it is constituted so that the total light transmittance of a cover tape may be not less than 80% preferably not less than 70%, the

electronic parts of the inside enclosed with the carrier tape can check with viewing or machinery. When lower than 70%, the check of inner electronic parts is difficult.

[0011]Next, in drawing 2, it is extension or the unstretched film of polypropylene and nylon as the outer layer 2 and the 2nd layer three of the inside, and is the film which was excellent in shock resistance and tear resistance according to 6-50-micrometer-thick transparence. In less than 6 micrometers, this layer 3 runs short of tear resistance, and if 50 micrometers is exceeded, it will become unstable [sealing nature]. by the way, the case where an outer layer is used although there is a biaxial extension nylon film as a film which was excellent in transparency and was excellent in heat resistance, and tear resistance and shock resistance -- heat sealing -- slide nature with a trowel is bad and is not suitable for the sealing machine in particular of a sliding type. Since the problem of blocking will occur if an outer layer is used, since hygroscopicity is large, it is not suitable for an outer layer. The side which the outer layer 2 and the layer 3 touch mutually can perform surface treatments, such as corona treatment, plasma treatment, and sandblast treatment, if needed, can raise adhesion power, can be extruded, and can be pasted together by a lamination, dry laminate, etc. The interlayer 4 and the glue line 5 are drawing 1 and the construct.

[0012]

[Example]Although the example of this invention is shown below, this invention is not limited at all by these examples.

<<Examples 1-7 and comparative examples 1-5>> What laminated the film which is not extended [what laminated the biaxial oriented film in the outer layer, and laminated the interlayer in the inside like the lamination shown in Table 1 and 2, the extension which was further excellent in tear resistance and shock resistance between the outer layer and the interlayer, or] was produced. The side which touches the layer excellent in an interlayer's outer layer or tear resistance, and shock resistance carried out solution film production of the glue line by the roll coater in the opposite hand at 2 micrometers of thickness. The density of an interlayer's resin, the melting point, the tearing strength of a film, **** impact strength, and the degree of cloudy weather were collectively shown in Table 1 and 2. The kind and addition of conductive impalpable powder are shown in () after a glue line. An addition is thermoplastics of a glue line. It is the quantity (weight section) to 100 weight sections. It heat sealed with the carrier tape made from polystyrene of 16-mm width after the slit to 13.5-mm width about the obtained prototype, the existence of the tape piece was judged and combined with the high-speed exfoliation machine (42000 mm/min), and peel strength was measured (reading per second: 300 mm/min). Measurement of the surface resistance value by the side of a glue line, the visible light transmissivity of a cover tape prototype, and **** impact strength was performed, and the result was shown in Table 3 and 4.

Heat-sealing conditions: A 120 **/1kg/cm²/1sec, and sliding type seal, seal width 1 mmx2 peel

conditions: 180-degree peel, peel speed 300 mm/min and number of samples:3 [0013]The passage of the following [raw material / which was used].

- PE : polyethylene and PET:HORIECHIREN terephthalate which used the metallocene catalyst for the polymerization (unextended)

- O-PET:biaxial-stretching polyethylene terephthalate and PP : polypropylene (unextended)

- OPP:biaxial-stretching polypropylene and NY : nylon (unextended)

- ONY: -- biaxial stretching -- nylon, an EVA:ethylene vinyl acetate copolymer, PVC:polyvinyl chloride, and LDPE: -- low density polyethylene, LLDPE:straight-chain-shape low density polyethylene, SnO₂:tin oxide, and ZnO₂: -- a zinc oxide [0014]

table 1 -- real -- ** Example 1 2 3 4 5 6 and outer layer . Use resin O-PET O-PET O-PET. OPP O-PET OPP thickness (micrometer). 25 12 916 12 25 and the 2nd layer . Use resin - ONY PP NY OPP. - thickness (micrometer) 12 15 15 15 and interlayer use resin . PE PE PEPE PE PE thickness (micrometer). 20 30 50 15 40 30 density (g/cm³) -- 0.905 0.905 0.910 0.920 0.915 0.905 -- the melting point (**) 90 88 100 105 103 93 -- tearing strength (kg/cm). 124 145 120 110 130 145 **** impact strength 120 125 110 105 107 112 (kg-cm/cm²) the degree of cloudy weather (%) 87 13 12 13 10 and glue line . Adhesives PVC system acrylic PET system polyurethane system EVA system butadiene series used Conductive impalpable powder SnO₂SnO₂ZnO₂ZnO₂SnO₂SnO₂ (weight section) 150 250 320 600 900 200[0015]

Table Two Example Ratio ** Example 7 1 2 3. 45 and outer layer Use resin O-PET O-PET. OPP O-PET OPP O-PET thickness (micrometer). 16 25 2516 25 16 and the 2nd layer . use resin ONY - - OPP - ONY thickness (micrometer). 12 15 12 and interlayer Use resin PE. LLDPE - 5%EVA LLDPE. LDPE thickness (micrometer) 40 30 30. 20 40 Density (g/cm³). 0.910 0.908 0.933 0.915 The 0.919 melting point (**) 102 120 125 125 and 128 tearing strength (kg/cm) -- 124 85 45 105 60 **** impact strength 120 75 35 100 45 (kg-cm/cm²) the degree of cloudy weather (%) 1120 13 18 8 and glue line .Adhesives styrene system PET system polyurethane system EVA system acrylic EVA system used Conductive impalpable powder SnO₂ZnO₂SnO₂SnO₂ surface-active agent SnO₂ (weight section) 400 150 7 12002 1500 [0016]

Table Three fruits ** Example 1 2 345 6 high-speed exfoliation TESUTOTE - PU piece Nothing Nothing Nothing Nothing Nothing Peel strength Initial value 40 45 30 25 43 52 40 ** - 90%,30 days 55 45 28 62 38 55 60 **, 30 days 68 50 55 7580 68 Exfoliation method of a glue line Transfer Transfer Transfer Transfer Transfer Transfer **** impact strength 420 505 350 220 430 450 (kg-cm/cm²)

Surface resistance value (omega/**) 10⁹10⁸10⁶10⁷10⁵10⁸ total light transmittance (%) 88.0 85.2 76.3 50.7 25.8 81.0[0017]

Table Four examples Ratio ** Example 7 1 2 3 4 5 high-speed exfoliation TESUTOTE - PU piece
 Nothing **** **** Nothing **** Nothing Peel strength Initial value 25 10 45 5 35 11 40 ** -90%, 30
 days 30 5 15 0 5 2 60 **, 30 days 45 48 150 10 25 15 Exfoliation method of a glue line
 Transfer Transfer Interface Transfer Transfer Transfer **** impact strength 505 350 220 430
 280 550 (kg-cm/cm²)
 Surface resistance value (omega/**) 10⁷ 10¹² 10¹⁴ 10⁴ 10¹⁴ 10⁴ total light transmittance (%)
74.3 72.6 89.5 45.6 88.0 30.5[0018]

[Effect of the Invention] A point without the danger that a tape piece trouble will occur although improvement in the speed of a mounting machine progresses by using the cover tape of this invention, Electrostatic processing is carried out by the glue line and Contact with electronic parts and a cover tape. With or the combination of the point and heat-sealing lacquer adhesives which the static electricity generated at the time of exfoliation of a cover tape is stopped, and do not have on sealing nature, either, and an interlayer. Since a seal's being possible at low temperature and peel-off intensity's being arbitrarily set up in the range of 10 per mm - 120gr and peel-off intensity are determined by the adhesion strength between the layers in a cover tape, Not receiving influence in seal conditions with a carrier tape and transparency according to five points that the inspection of the device which is contents well is easy. The problem that the dependency over the seal conditions of peel-off intensity is large at the same time it solves the problem of raising a tape piece at the time of the exfoliation which is the conventional problem, And the problem of the static electricity generated at the time of the contact with the problem which changes with storage environment temporally and electronic parts, and a cover tape, or exfoliation of a cover tape can be solved, and the stable peel-off intensity can be obtained.

[Translation done.]